

Figure 1 – diagram of gain adjust setup.

2 pictures of Rec/Mod chassis showing I – Q module with gain control pots.

Part 1 – gain adjustment

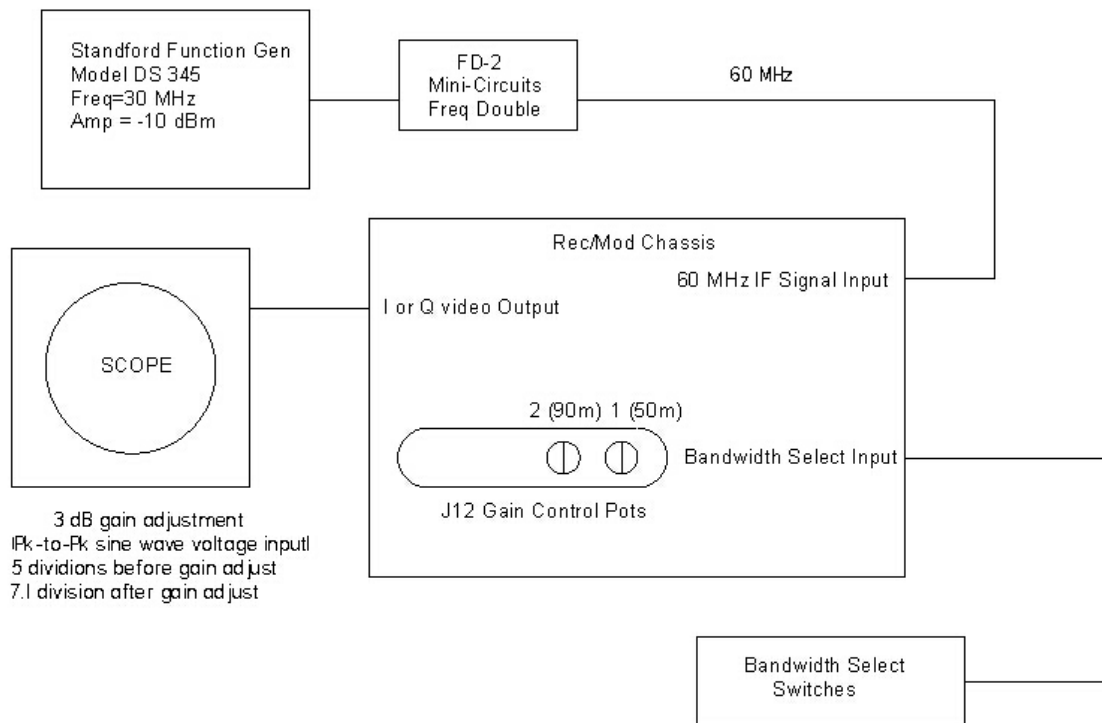
- 1) Shut down the radar and turn off all the power to the rack with the receiver/mod chassis.
- 2) Remove the chassis from the rack, take off the cover. Remove the screws that hold down the upper plate that contains the IF attenuator, etc.
- 3) Tilt the plate into the vertical position and secure using the right angle brackets.
- 4) Set up the Stanford function generator with a sine wave output at a frequency of 30 MHz and an output amplitude of -10dBm (it should power up with values near these)
- 5) Connect the mini-circuits doubler to the BNC output of the generator and connect the output of the doubler to the receiver input with a BNC cable. Make sure the amplitude setting is -10 dBm .
- 6) Connect the bandwidth control switches to the rec/mod chassis and set the switch so front panel range is selecting 50 m.
- 7) Connect a scope to the I or Q output of the rec/mod chassis and set the scope's amplitude scale to observe a sine wave output that covers about 5 units. Using the amplitude adjustment feature on the generator set the amplitude to cover exactly 5 divisions.
- 8) Adjust pot #1 so the output amplitude increases to a value that covers 7.1 divisions on the scope scale. This increases the gain of the receiver by 3 dB.
- 9) Without changing any settings on the generator or the scope, select the bandwidth for 90 m.
- 10) Now adjust pot #2 for an amplitude of 7.1 division on the scope. Both bandwidths now have relatively the same gain. The adjustment is done.

Part 2 – measure an estimate of the receiver bandwidth – the frequency will be adjusted until the output voltage amplitude falls to half the value of the center frequency amplitude.

- 1) Set the receiver bandwidth for the 50m mode. Adjust the generator amplitude so the scope scale has a convenient reading of 6 units peak to peak. (use 0.2 volts per division as a convenient scale.)
- 2) Select the frequency setting for the generator display – set the frequency step size to 100,000 Hz by selecting the step size button then using the up/down buttons to select the size. Press the step size again to return to the frequency setting.
- 3) Step the frequency **down** (using the up/down buttons) until the amplitude is near the 3 units mark (half the original amplitude – signal change of 6 dB)

- 4) Set the frequency step size to 10,000 Hz using the same procedure as in 2. Adjust the frequency until the amplitude is 3 units peak to peak. Note the frequency and the difference from 30 MHz. The *computed* receiver bandwidth will be approximately 4 times the difference, record this computed bandwidth.
- 5) Set the frequency of the generator back to 30 MHz.
- 6) Set the receiver bandwidth for the 90m mode.
- 7) Repeat steps 2 through 4 and record the *computed* bandwidth for the 90m mode. This ends part 2.

Replace the upper plate and cover, return the unit the rack and install all the cables. Turn on the power to the rack and check that the radar is operating properly.



System Configuration for receiver gain adjustment
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